The Alaska Seaweed Genetics Workshop (April 2024)

# Searching for seaweed solutions

**Jessica Whitney**, Ginny Eckert,
Melissa Good, & Hannah Wilson

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Alaska Fisheries Development Foundation, Inc.

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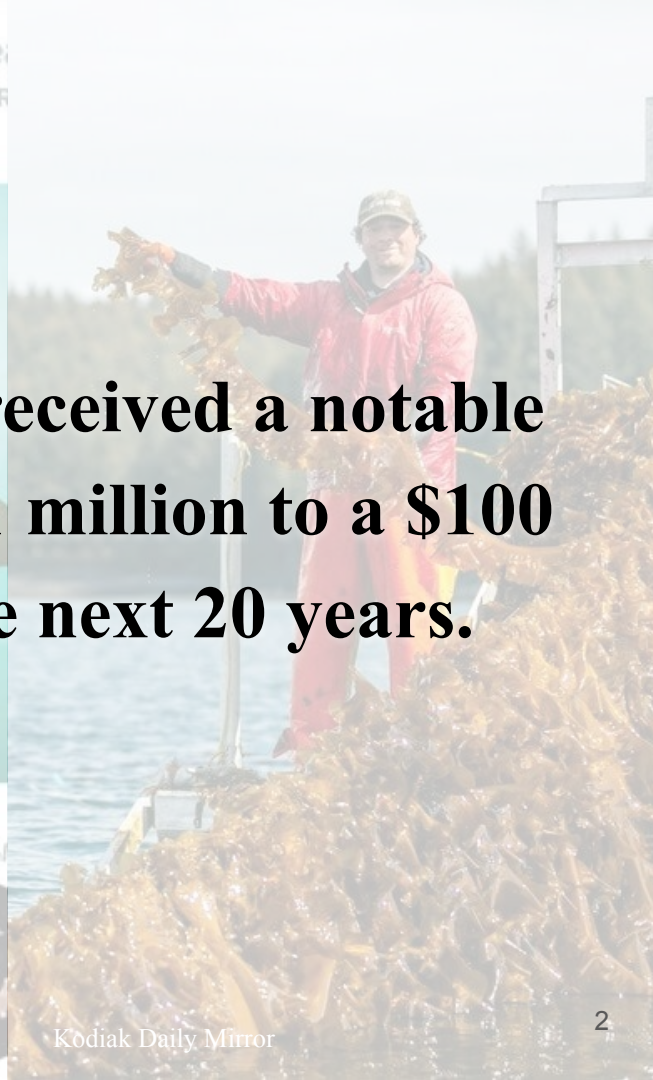

**Within the last 5 years, Alaska has received a notable amount of funding to grow from a $1 million to a $100 million mariculture industry in the next 20 years.**

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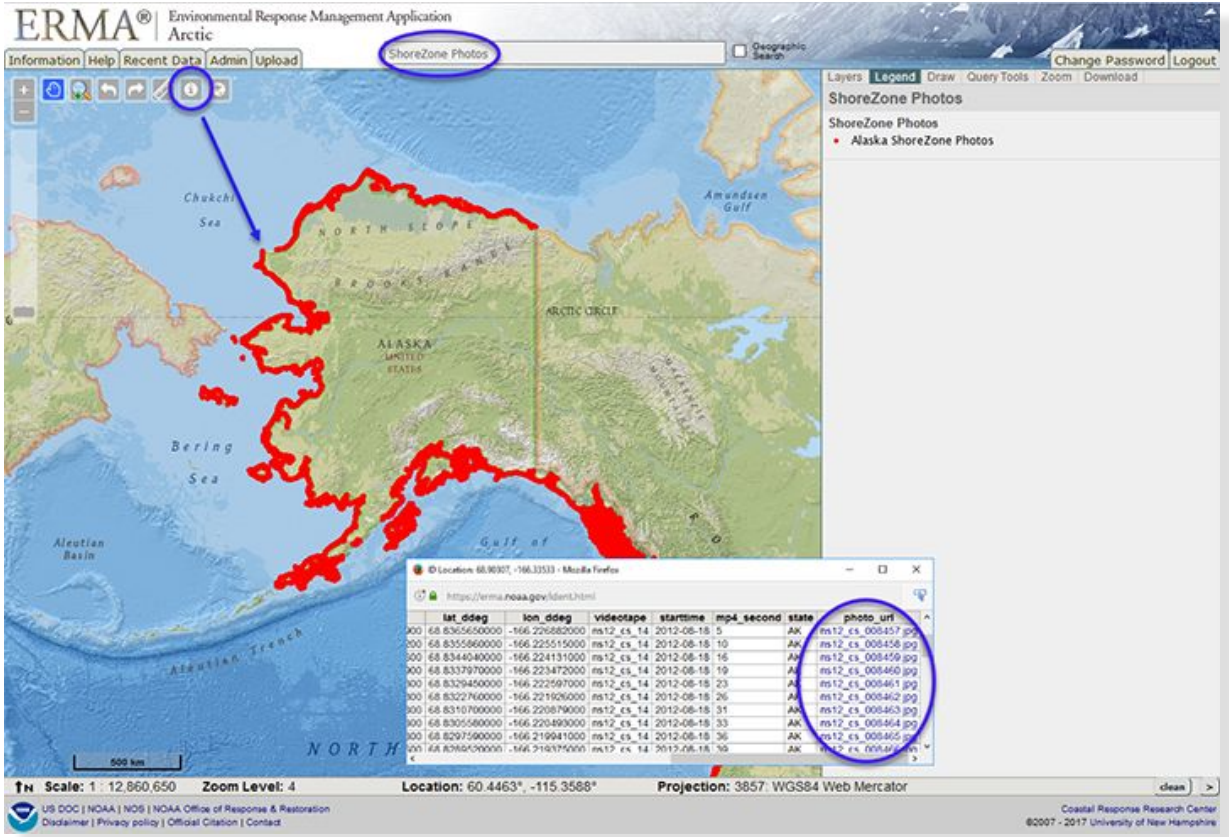
JEDC

AFDF

Kodiak Daily Mirror

The state of Alaska has more than **46,000 miles** of nutrient-rich coastline.

(More than Oregon, Washington, and California combined!)




https://response.restoration.noaa.gov/about/media/alaska-shorezone-mapping-over-46000-miles-coastal-habitat.html

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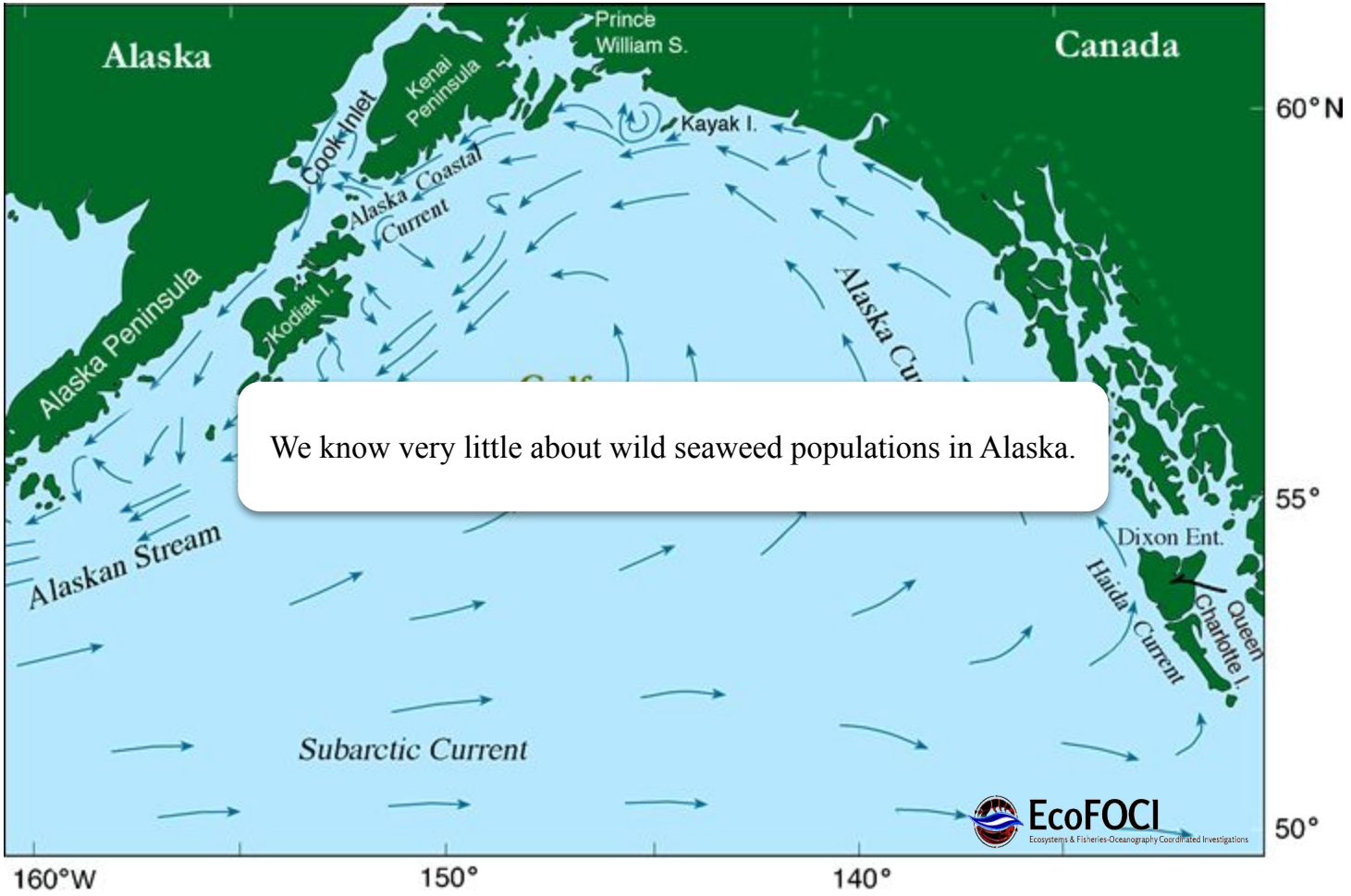
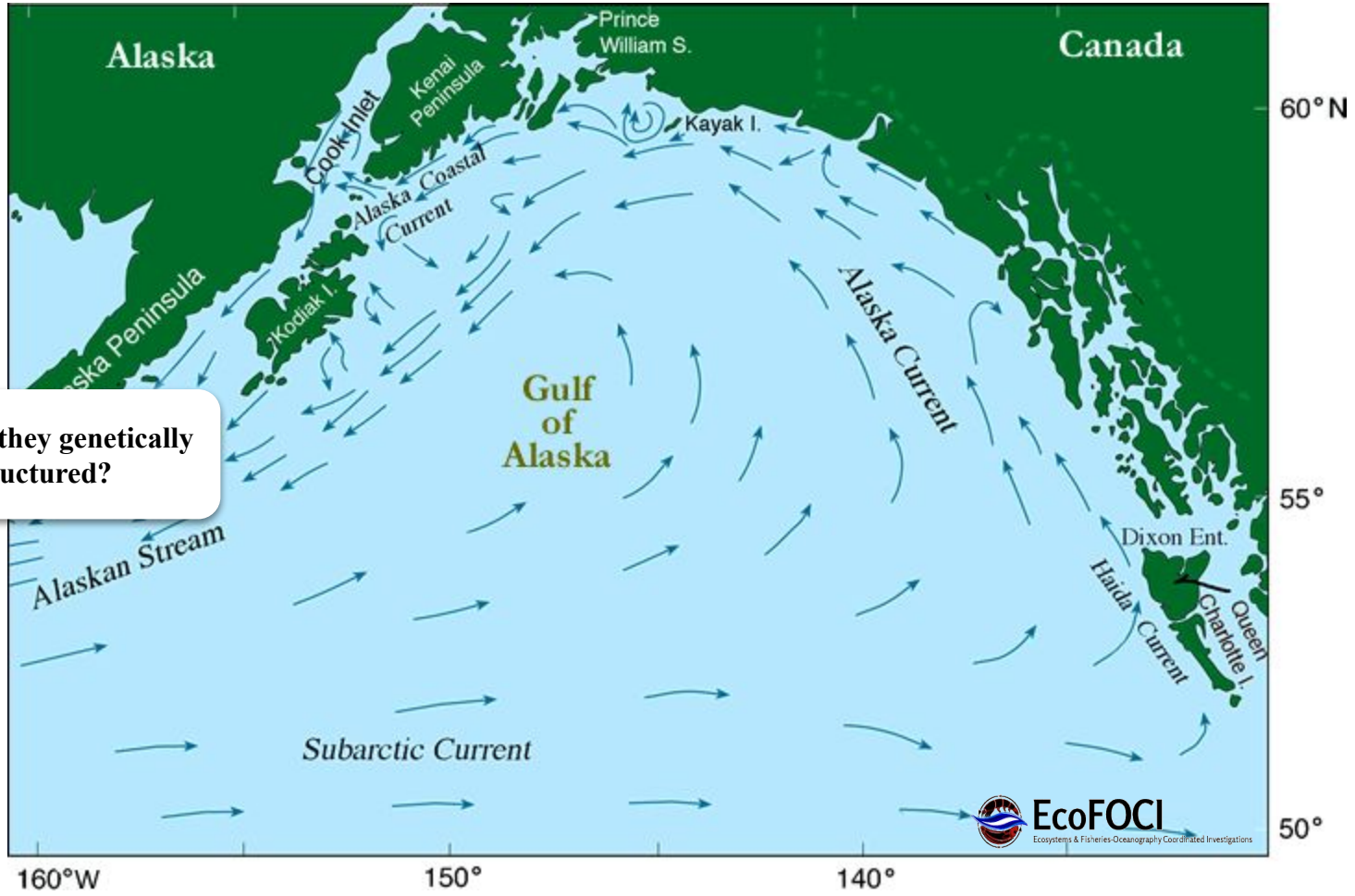

Alaska
Canada
Prince William S.
Kenai Peninsula
Cook Inlet
Kayak I.
Alaska Coastal Current
Alaska Peninsula
Kodiak I.
Alaska Current
Alaskan Stream
Dixon Ent.
Haida Current
Queen Charlotte I.
Subarctic Current
60° N
55°
50°
160°W
150°
140°
We know very little about wild seaweed populations in Alaska.

How are they genetically structured?

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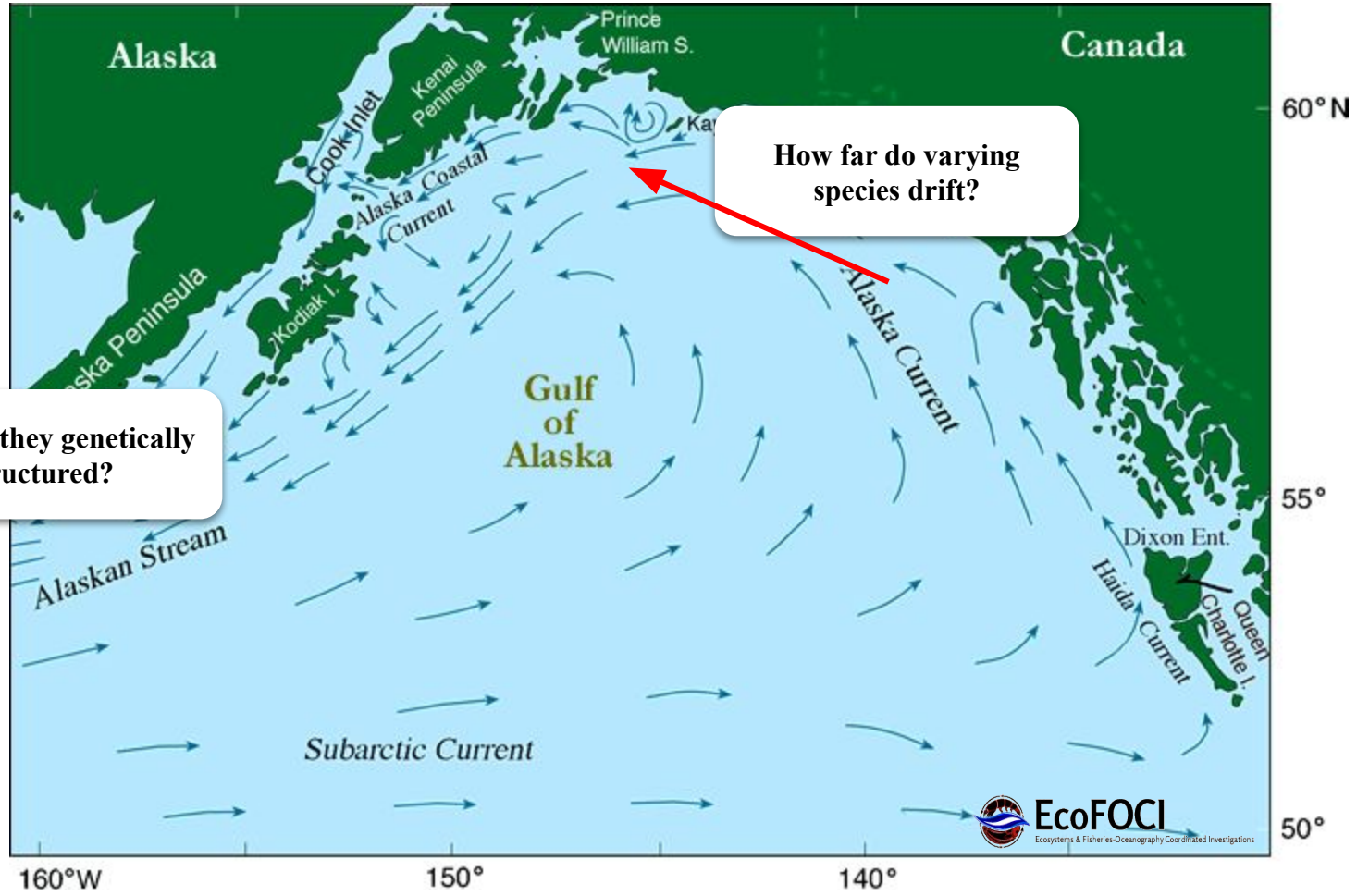


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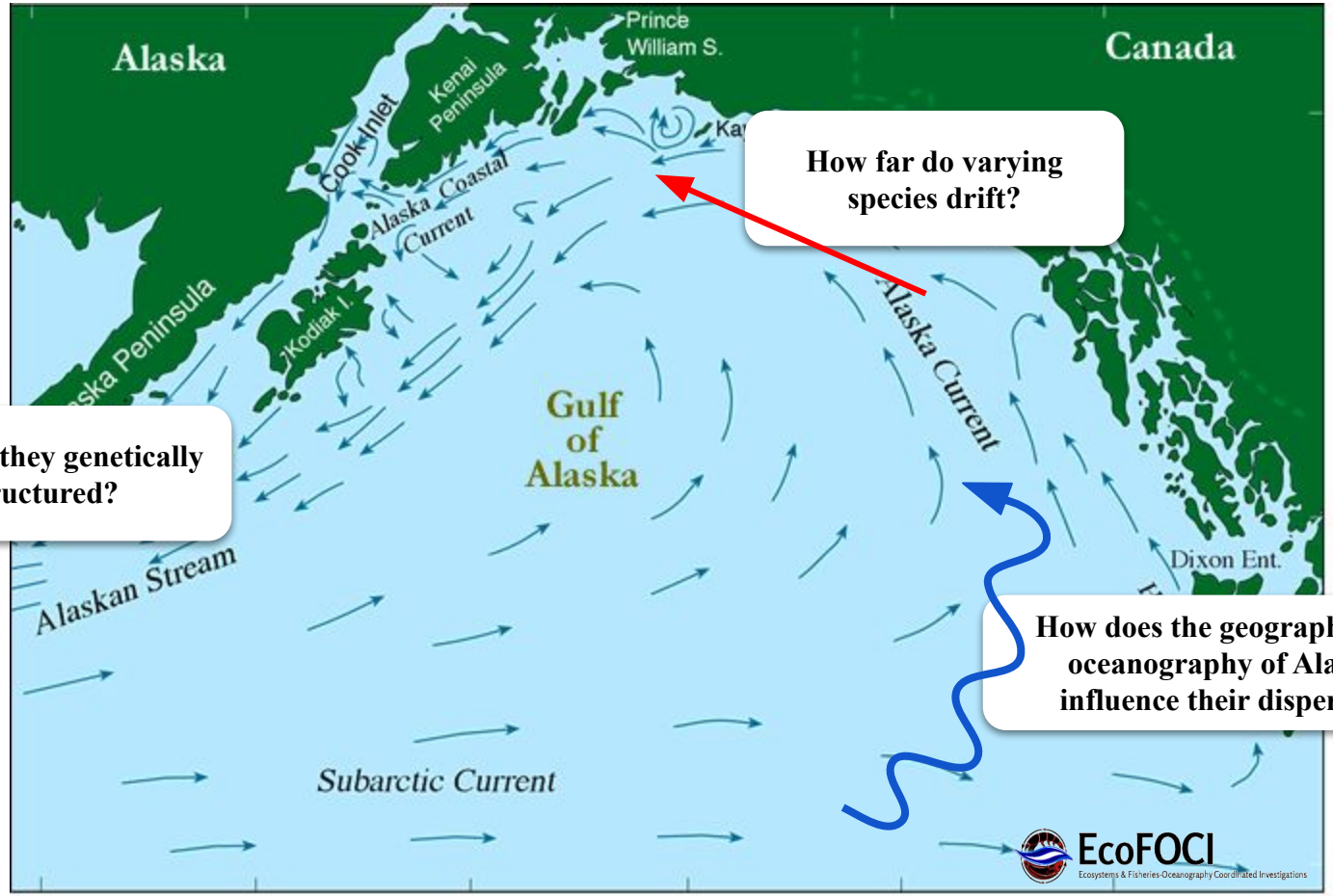


**How far do varying species drift?**

**How are they genetically structured?**

**How does the geography and oceanography of Alaska influence their dispersal?**

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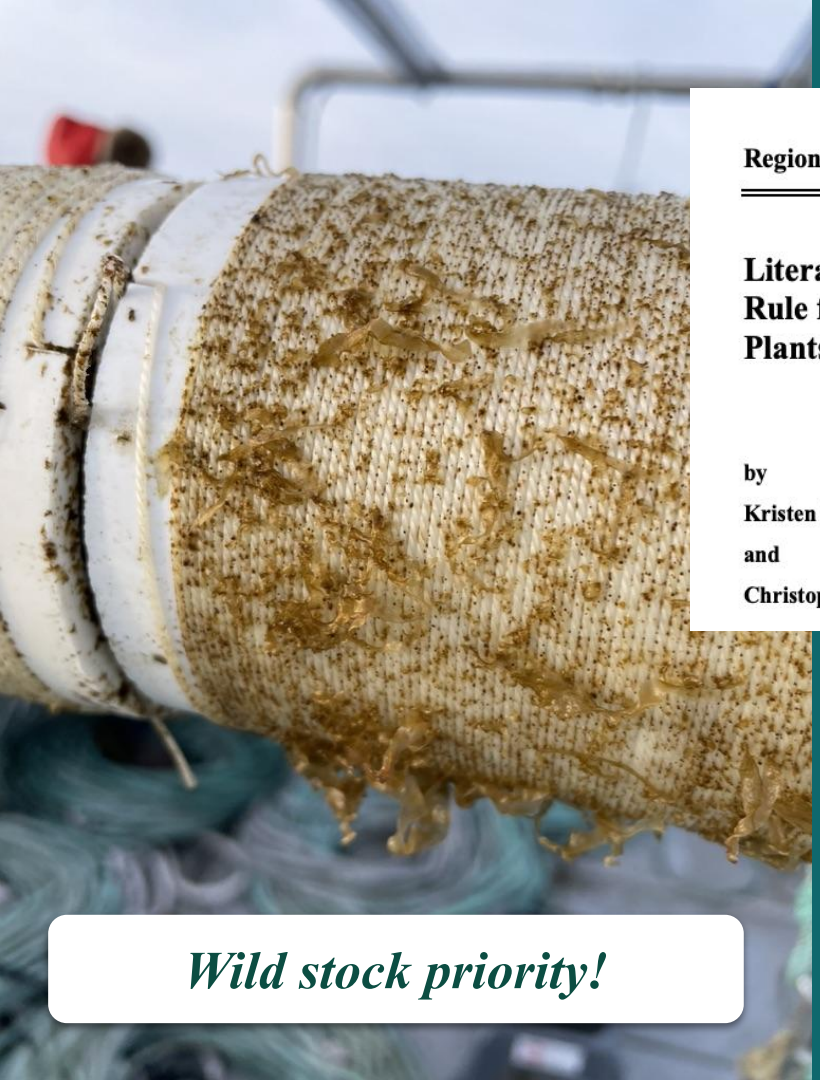
EcoFOCI
Ecosystems & Fisheries-Oceanography Coordinated Investigations



2016

Regional Information Report No. 2A22-01

# Literature Review for Implementation of the 50-50 Rule for Cultivation of Seaweeds and other Aquatic Plants in Alaska

by
Kristen M. Gruenthal
and
Christopher Habicht

ALASKA DEPARTMENT OF FISH AND GAME

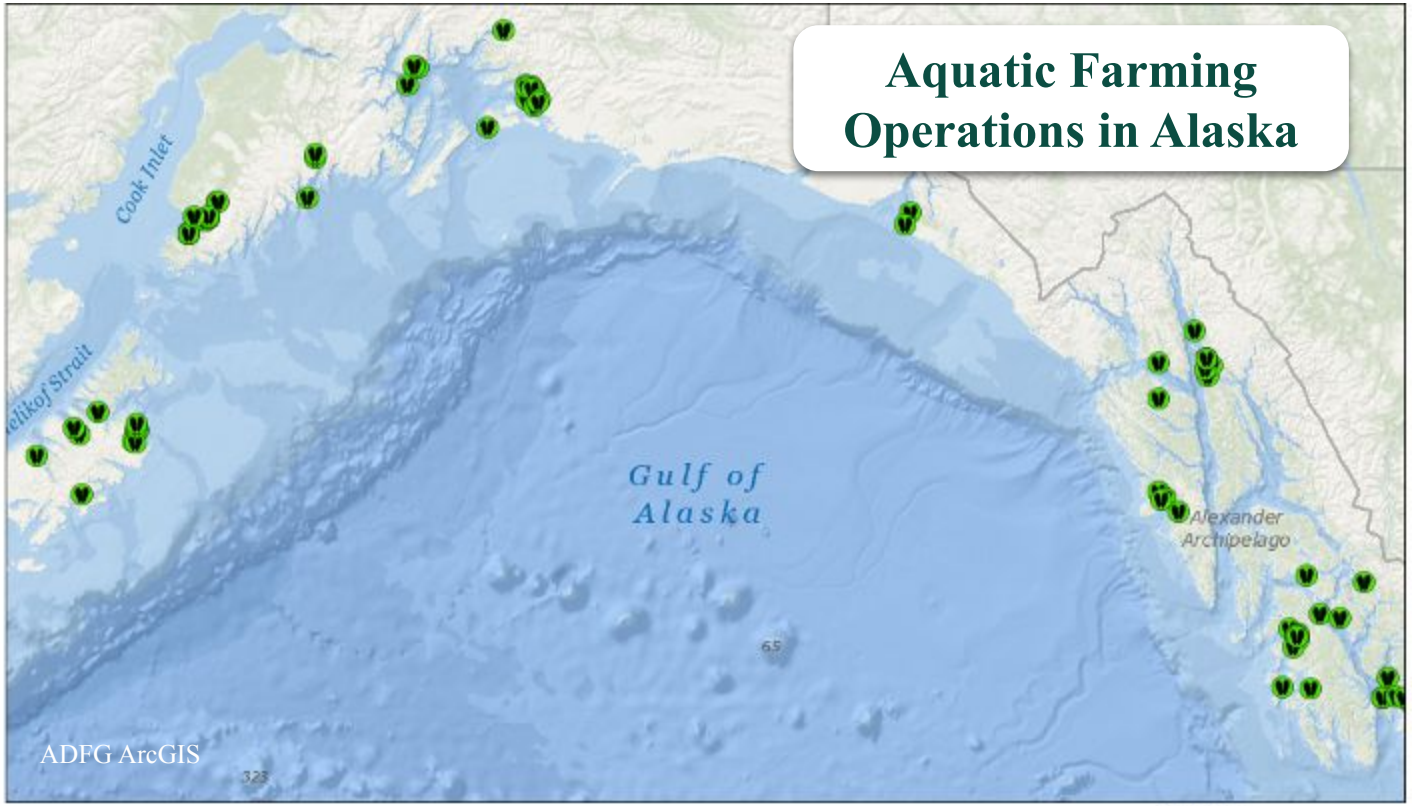
"1) limiting the distance from the site of collection to location of out planting to **50 km** by water

2) setting the minimum number of wild broodstock for each species, area, and year to **50** unrelated individuals"

***Wild stock priority!***

Gruenthal, K. M., and C. Habicht. 2022. Literature review for implementation of the 50-50 rule for cultivation of seaweeds and other aquatic plants in Alaska. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 2A22-01, Anchorage.

# Aquatic Farming Operations in Alaska

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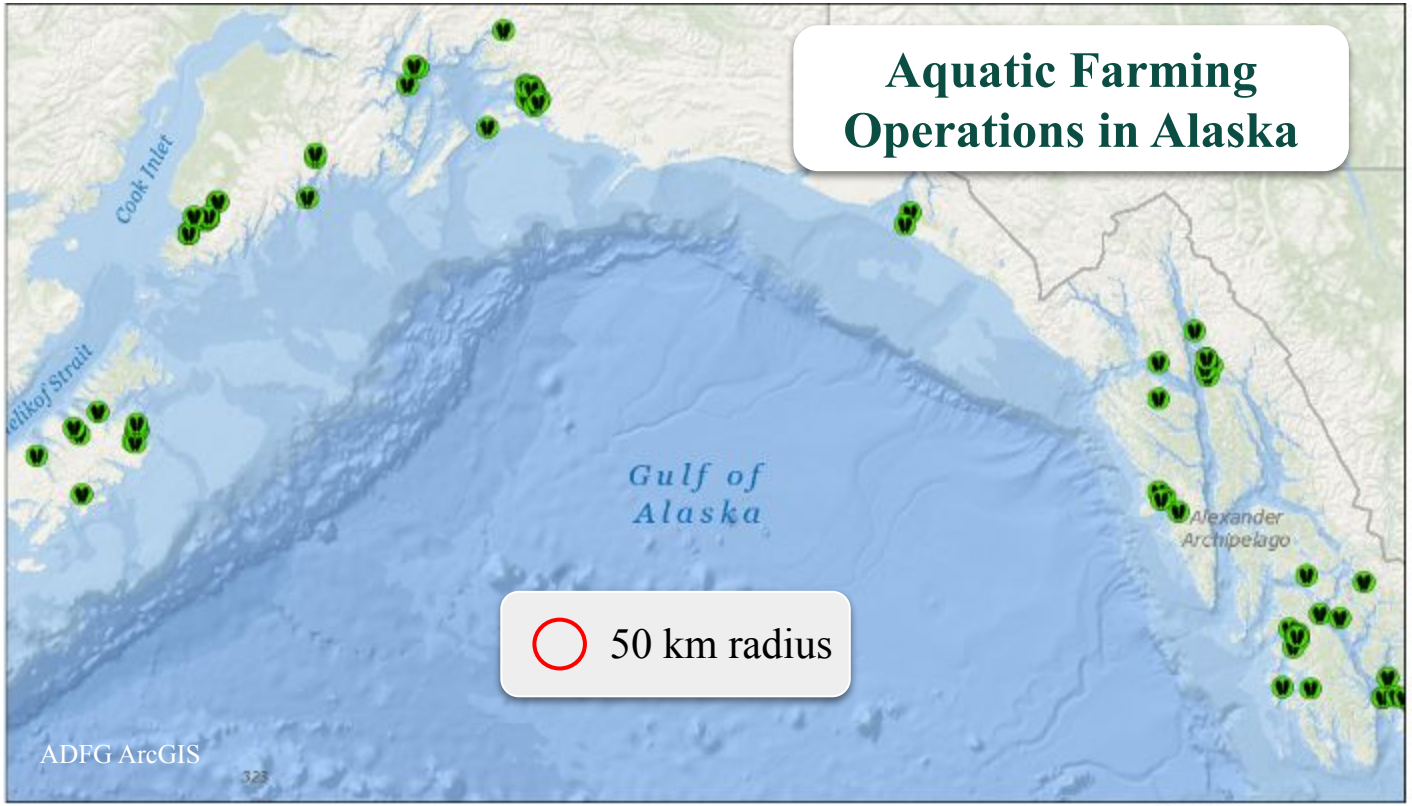


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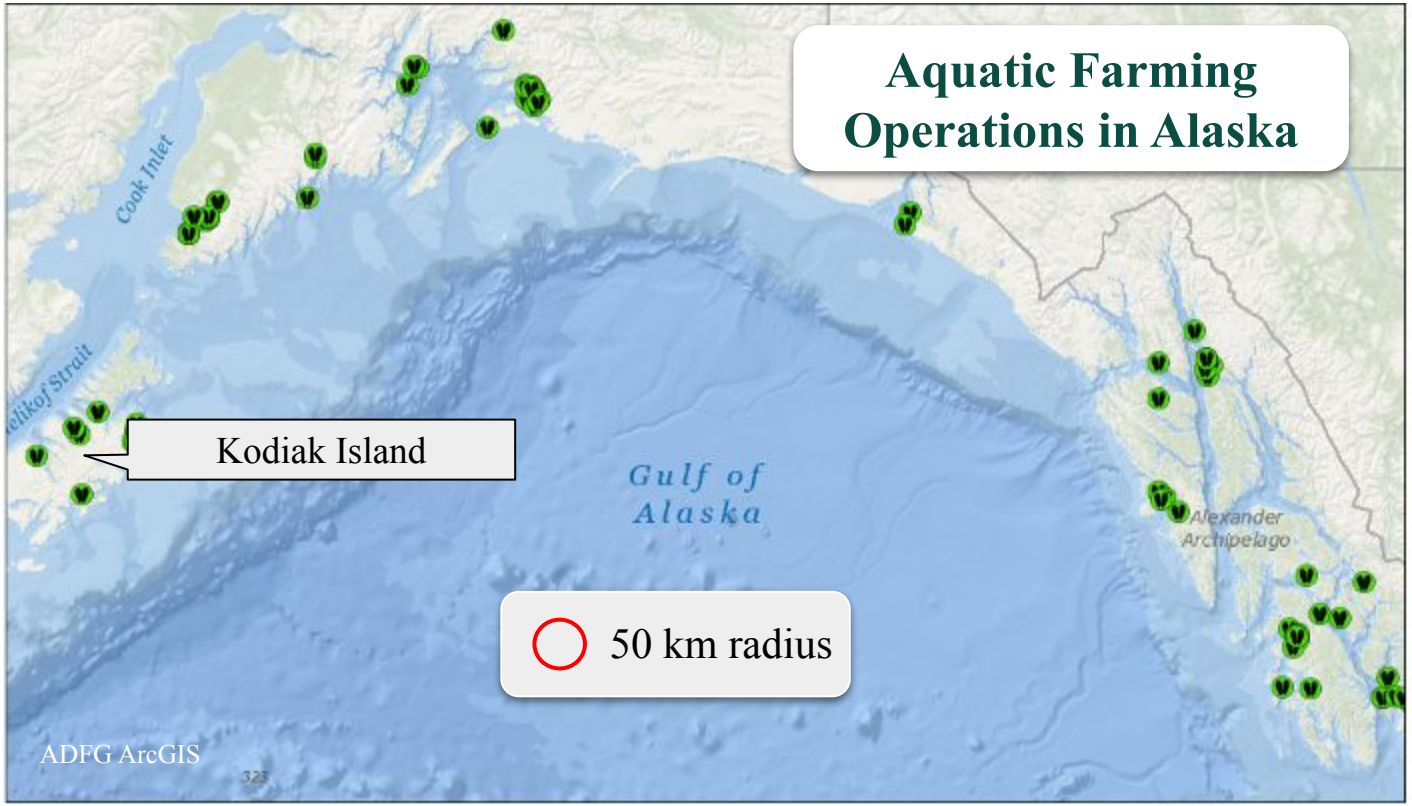


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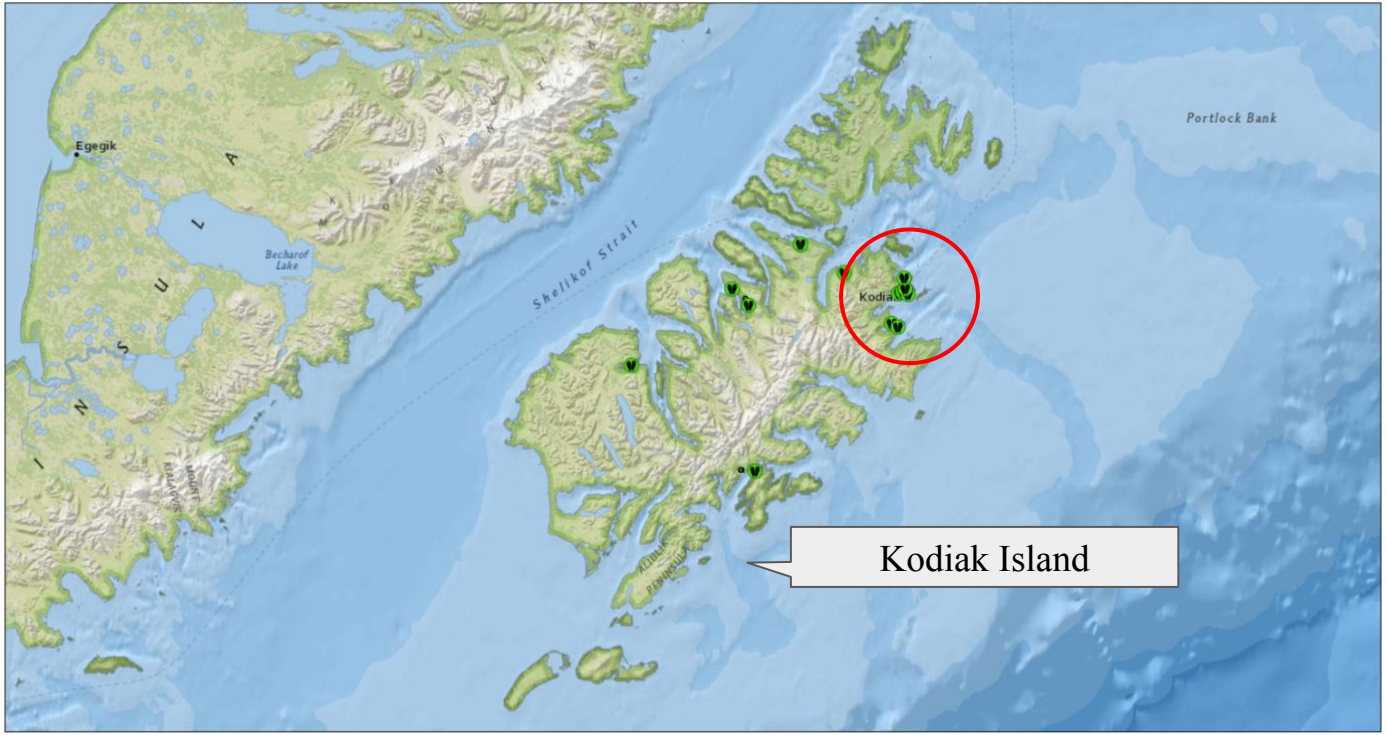
# Aquatic Farming Operations




8/20/2024, 4:30:52 PM

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Active Aquatic Farming Operation Details

Active Aquatic Farming Operation Corners

Active Aquatic Farming Operation Areas

0 15 30 60 mi

0 20 40 80 km

National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

ADF&G Web Map
ADF&G

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**This makes seed collection and hatchery growth difficult for farmers as …**

a. sori collection sites often change yearly
b. seed **cannot be shared** among farms
c. it must be cultured for **each farm** specifically
d. there is a relatively **low number of hatcheries** within the state that need to keep track of many different seed stocks to **prevent contamination**
e. shipping is **expensive**!

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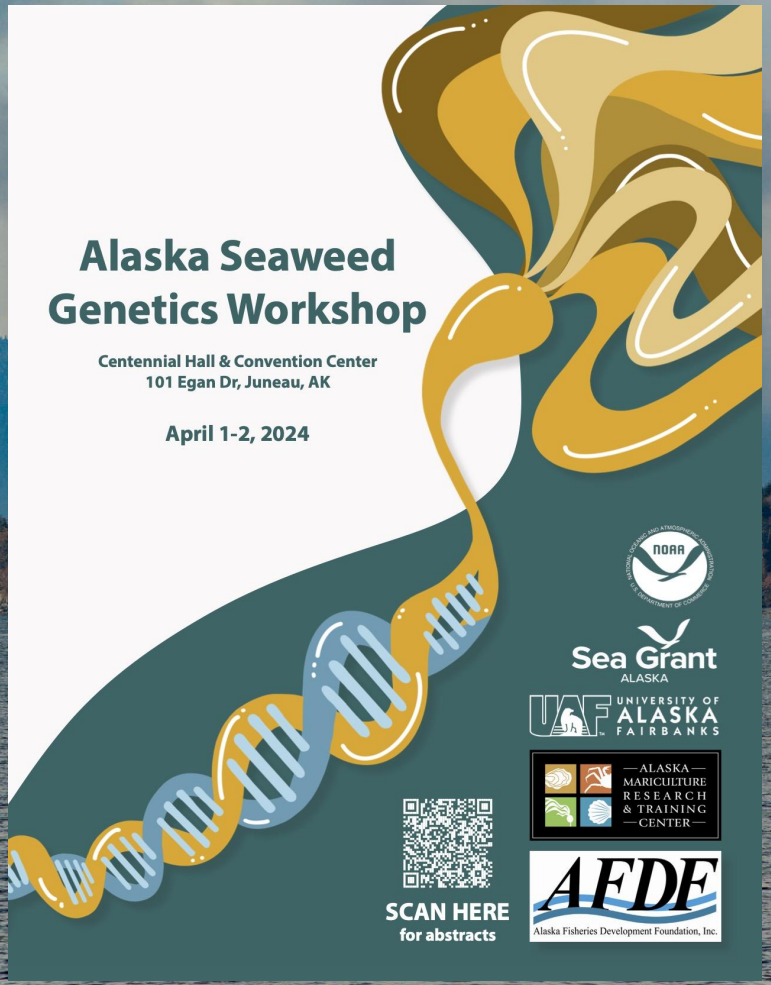


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# 56 guests and 15 presenters


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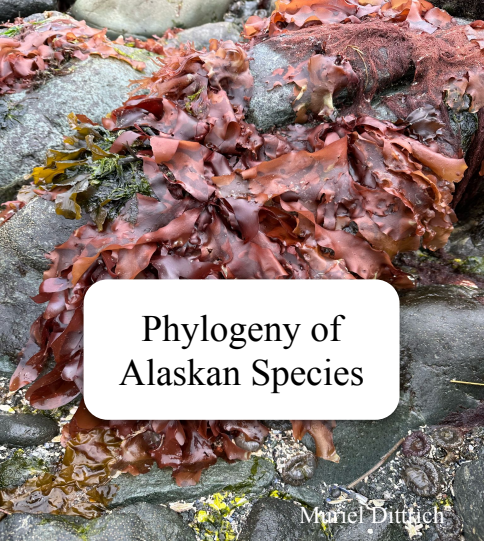
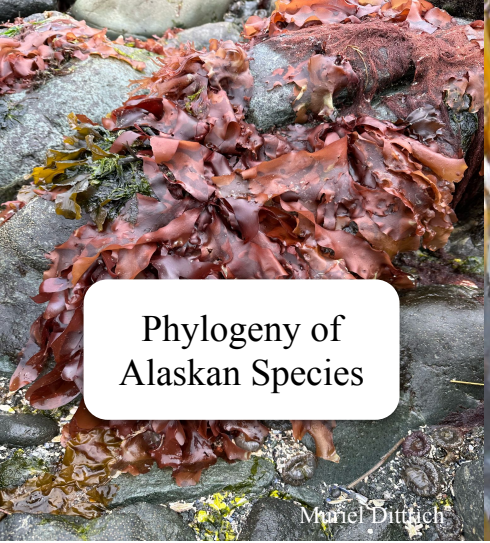

Phylogeny of
Alaskan Species
Muriel Dittrich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PopGen of Sugar Kelp in Maine
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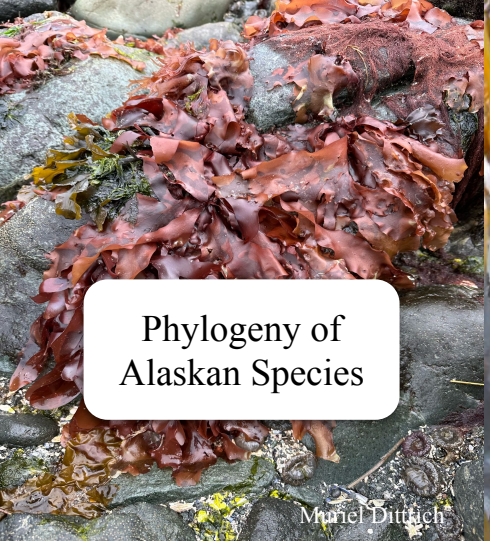
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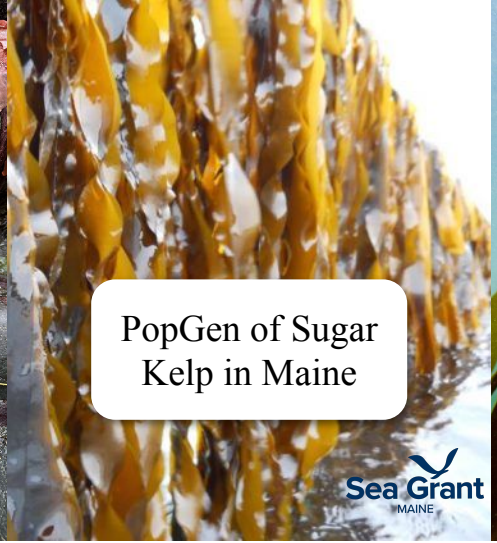
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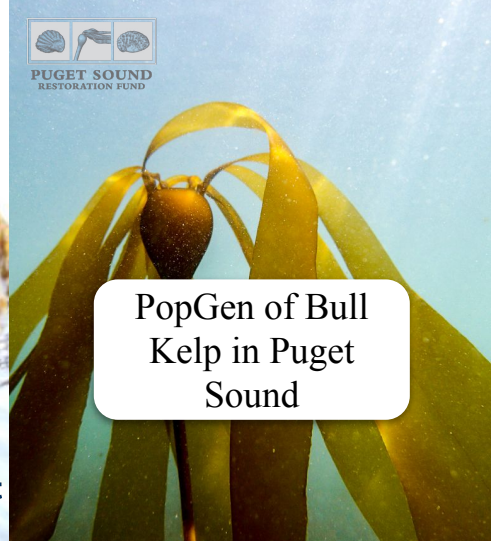
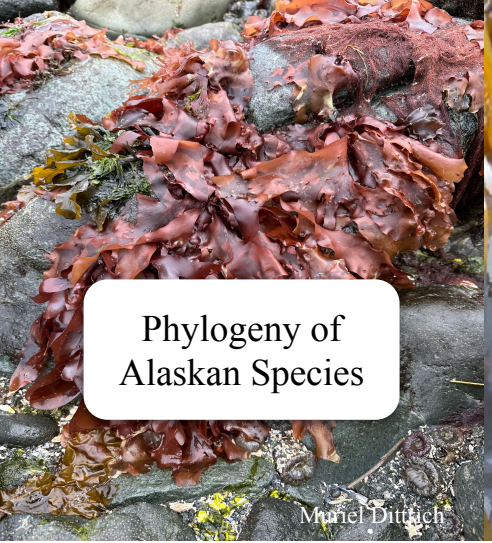

PUGET SOUND
RESTORATION FUND
PopGen of Bull Kelp in Puget Sound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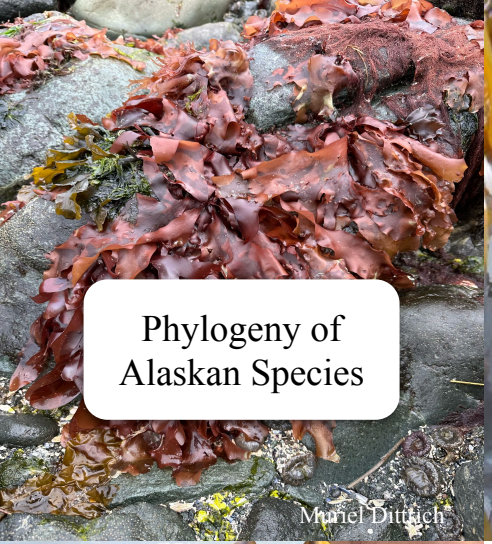
WOODS HOLE
OCEANOGRAPHIC
INSTITUTION
Selective Breeding of Sugar Kelp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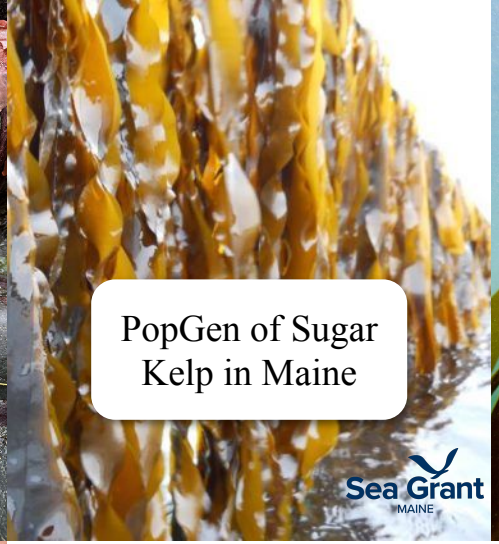
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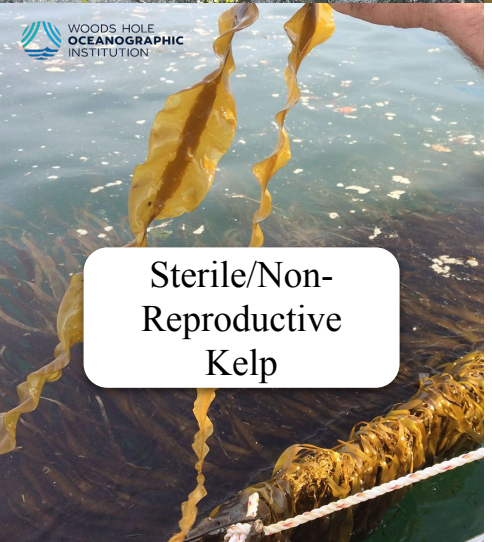
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OCEANOGRAPHIC
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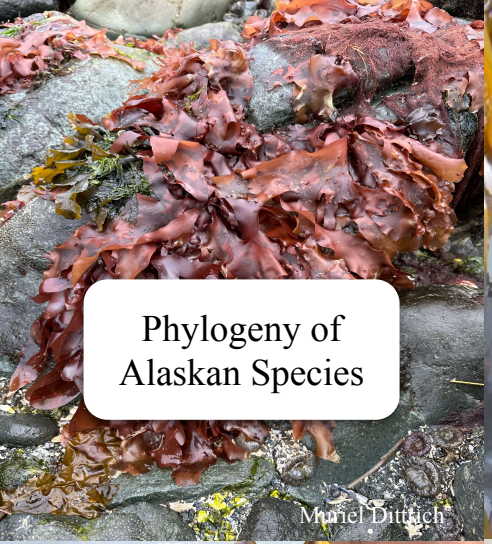
Sterile/Non-Reproductive Kelp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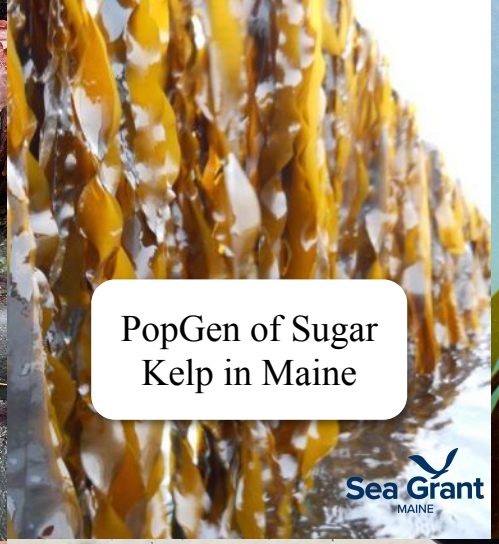
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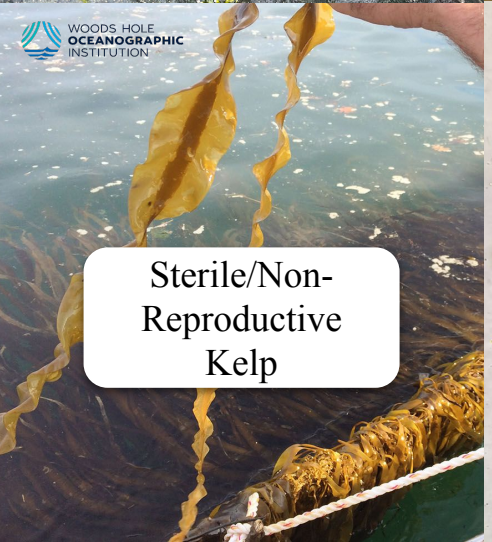
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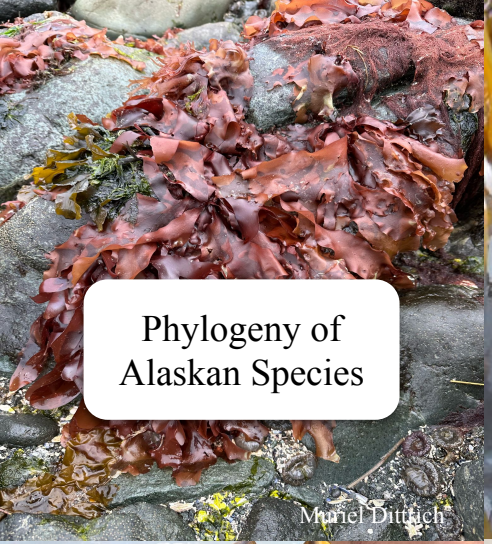
Pros & Cons of Gametophyte Cultivation
Tamsen Peeples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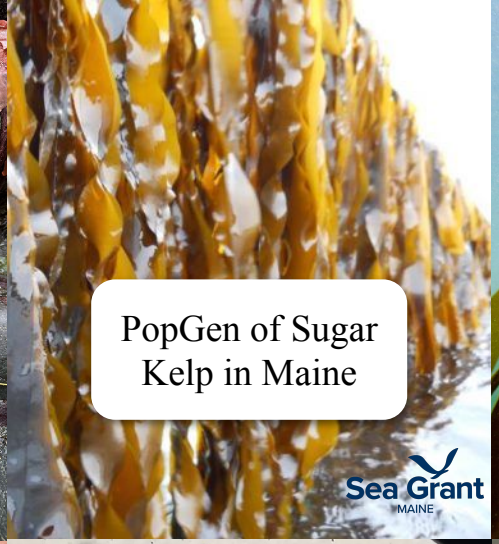
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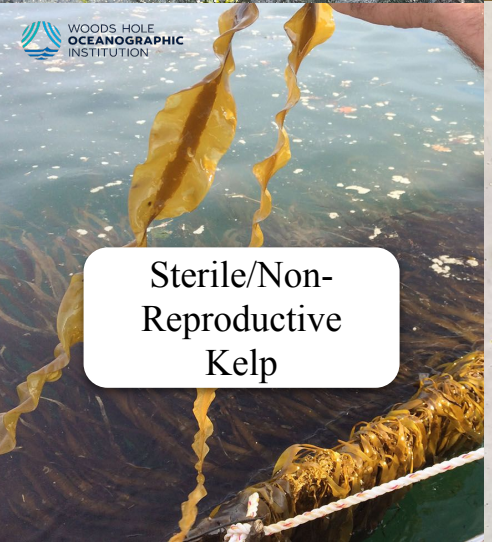
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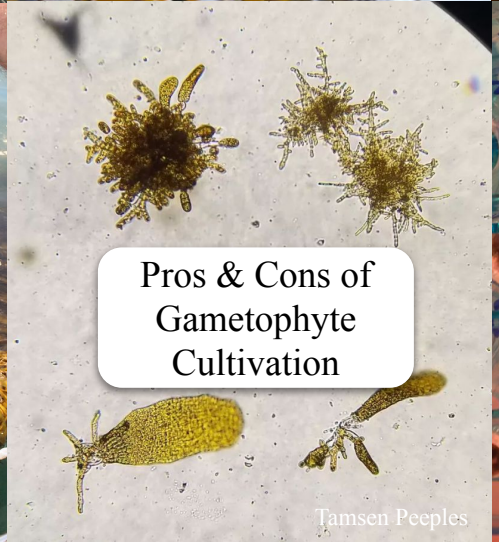
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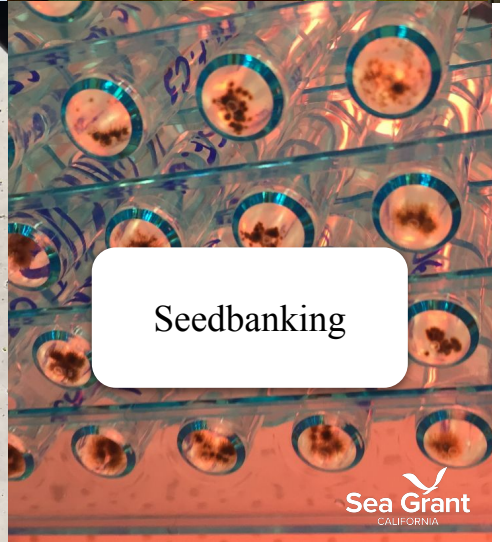
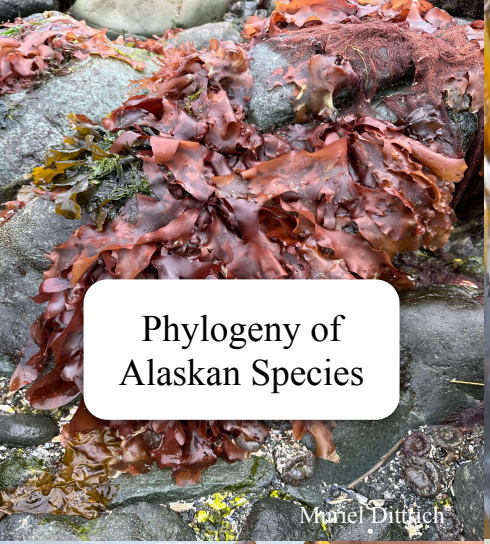

Seedbanking
Sea Grant
CALIFORNIA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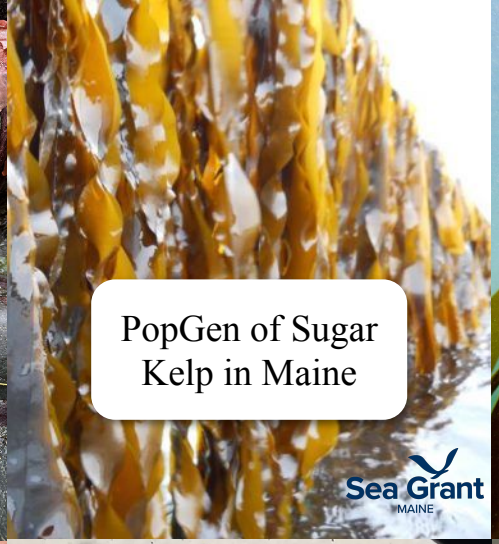
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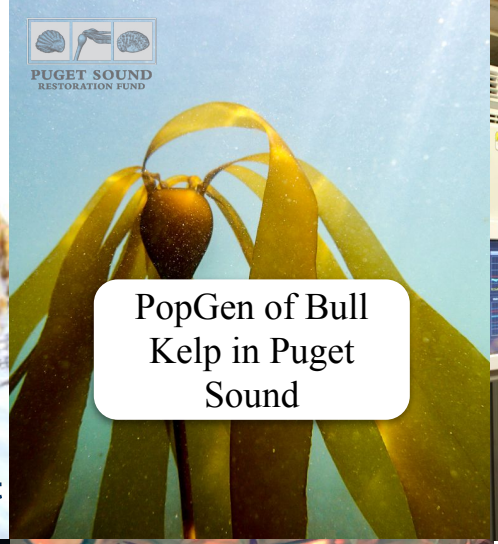
MAINE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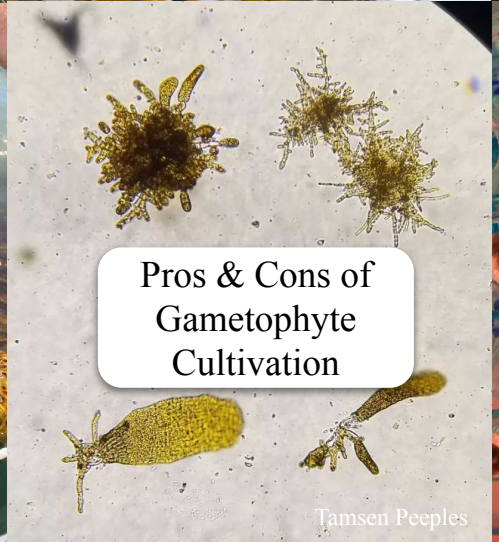
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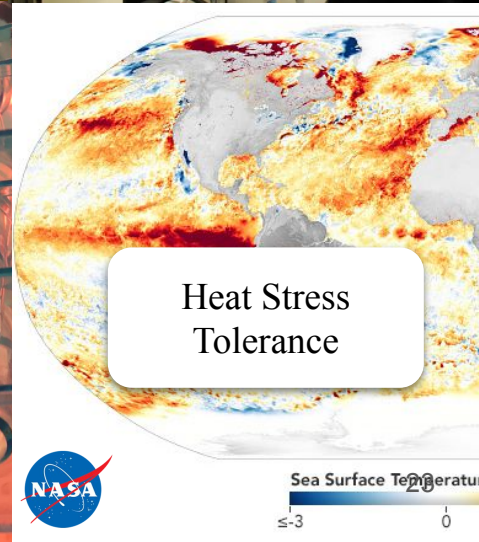
Heat Stress Tolerance
NASA
Sea Surface Temperatu
28
≤-3
0


Areas for future research

Applications of East coast work to an Alaskan land and sea-scape

Advantages and disadvantages of various techniques

Potential collaboration opportunities

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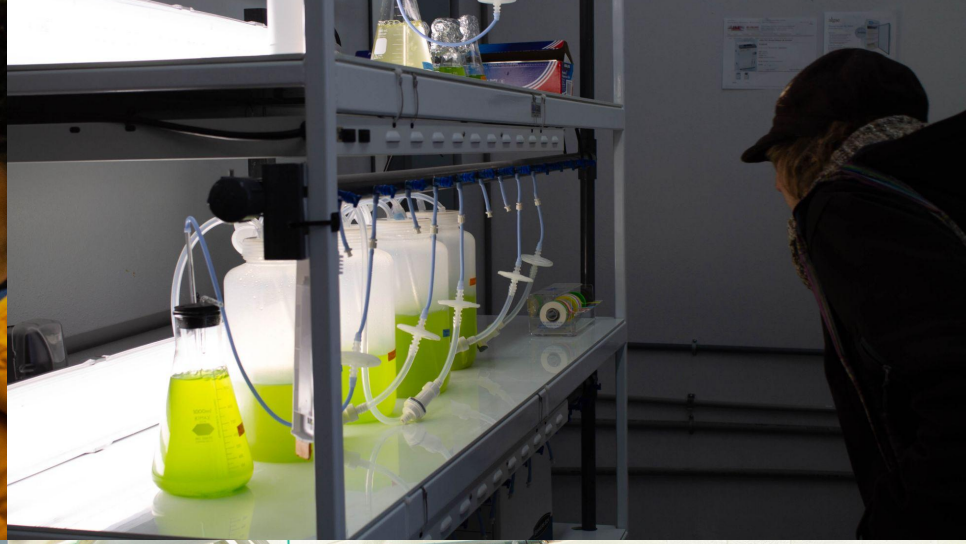


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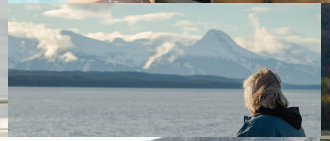
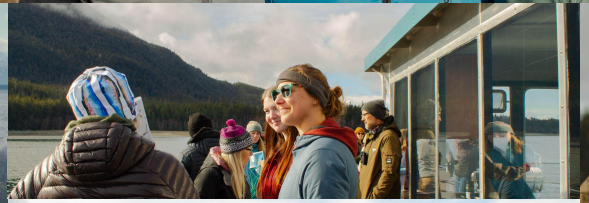
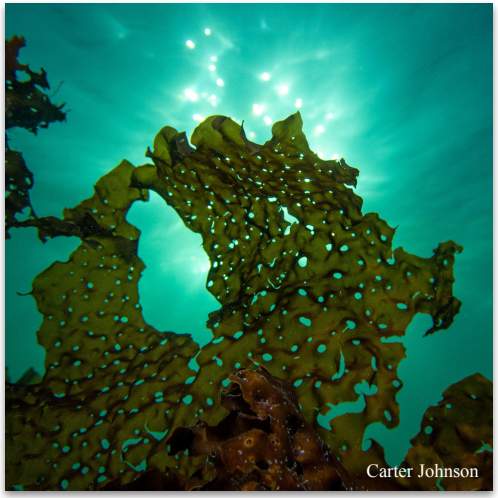





# Looking ahead …

- need a more thorough genetic understanding of Alaska's wild seaweed populations

  - on **small spatial scales**, particularly near current mariculture operations
  - across a variety of **species**





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# Looking ahead …


- implementing gametophyte and/or non-reproductive kelp cultivation in Alaska would require **more research** and a **thorough discussion** with state agencies

- Alaskan kelp farmers expressed concern that these kelp forms could be a **financial barrier** to upcoming kelp farmers entering the industry and also lead to **ownership discrepancies**

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Workshop attendees were supportive of seedbanking Alaskan macroalgae species for both **mariculture benefit** and **environmental concern** amidst a changing climate.

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# Acknowledgements

The Alaska Seaweed Genetics Workshop 2024 was funded on behalf of the **Exxon Valdez Oil Spill Trustee Council** for the Mariculture Research and Restoration Consortium (MarReCon) project.

**Special thanks to:**

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UAF COLLEGE OF FISHERIES AND OCEAN SCIENCES
University of Alaska Fairbanks

AFDF
Alaska Fisheries Development Foundation, Inc.

NOAA FISHERIES

ALASKA MARICULTURE RESEARCH & TRAINING CENTER

Sea Quester Farms

Mariculture Lab

# Thank you.

Contact: jmwhitney2@alaska.edu

Stay up to date with more Alaska mariculture events by following the Alaska Mariculture Research and Training Center (AMRTC)

*https://amrtc.org/*

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